

Procurement and Materiel
University of California /DOE
Contract W-7405-ENG-48
Department of Energy Defense Programs

December 27, 1996

Request for Expression of Interest (REI)
Accelerated Strategic Computing Initiative (ASCI) PathForward Project

Dear Colleague:

Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL), and Sandia National Laboratories (SNL), in support of U.S. Department of Energy (DOE) Defense Programs, are jointly seeking expressions of interest from U.S. Industry to develop key (critical path) technologies necessary to accelerate balanced 10-to-30 teraFLOPS system environments in the 1999 - 2001 time-frame. This is the initial phase of the PathForward Project, a component of the Accelerated Strategic Computing Initiative (ASCI) which supports the DOE Stockpile Stewardship and Management Program. The PathForward vision includes participation by the domestic commercial computer industry in accelerating development of key high performance computing technologies.

This Request for Expression of Interest is being issued to initiate dialog between the three Laboratories and interested commercial firms regarding key technologies that must be advanced to meet the ASCI PathForward goals. Participation is encouraged by both high-end integrated computer systems producers and independent computer product manufacturers in one or more of the technical areas described in the enclosed PathForward Project Description. Project efforts will be initiated using bi-lateral and/or multiple-party contracts, consortia or cooperative agreements. Work under the PathForward Project is expected to develop and demonstrate prototype technology for testing and must represent a viable path for the results to be incorporated in either complete high-end computer systems or in building blocks that may be used in creating high-end systems. The anticipated funding for the initial phase of this project is approximately \$10M per year, for a planned duration of two to four years.

If you are interested, your response must be received by **February 18, 1997**. Responses received after this date may not be accepted. If proprietary data is included in your submitted information, it must be marked "Proprietary" and best efforts will be exercised to avoid disclosure of such data to the general public.

Your response should describe specific technologies that would be of interest to your firm and can be developed and commercialized on a time-scale sufficiently rapid to impact future ASCI high-end platforms. The Project Description presents several development and engineering opportunities of specific interest. However, please feel free to suggest alternate subjects of potential. Be specific, concise and provide the following information:

1. **Critical Technology Bottlenecks for 10-to-30 TFLOPS Scale Scientific Computing**
- Provide a separate section for each technology you would propose to develop which would contribute to achieving the goal of a balanced, 10-to-30 TFLOPS computing environment. Include rationale for focusing on each technology proposed and how those key technologies are relevant and practical to the ASCI PathForward goal of

integration into future commercial product offerings. Your response should answer the following questions for **each** key technology proposed:

- a) Current Status of Critical Technologies - What is the current status of the critical technologies you would propose to develop? What is the current development path and schedule for these technologies, and what status might be expected between 1999 and 2001 without additional PathForward project support based on current business plans and market drivers?
 - b) Approaches to Accelerated Development - How would you achieve a systematic acceleration in the indicated technology area(s), particularly to 30 TFLOPS performance and beyond, for planned product offerings? Would this acceleration result in products which are useable on (compatible with) commercial computing platforms available from your company and from other companies?
 - c) Commercial Viability of Accelerated Technology - What is your company's commitment to the indicated technology direction? What path would you follow to incorporate this technology into a commercially viable product? What is the potential for high volume production, or in the case of software for high volume distribution, that might produce economies of scale and leverage the development costs?
 - d) Insertion Into 10-to-30 TFLOPS Platforms - Following completion of the proposed development activity, how will your organization insert the developed technology into 10-to-30 TFLOPS scale platforms of interest to the ASCI Program? Would the developed technology be made available to other companies for use in high-end computing platforms? If so, through what mechanism?
 - e) Estimated Cost of Accelerated Development - What is your budgetary estimate of the cost of the accelerated development activity described above?
 - f) Legal Structure of PathForward Efforts - Describe how a successful contract relationship should be structured to achieve the goals described in this document.
 - g) Appropriateness of PathForward Consortia - Would your proposal for accelerated development be enhanced by development within a consortium of several commercial organizations? Please describe your view of the appropriate scope and membership of such consortia, and the particular areas where such consortia would be most appropriate. Would your organization be willing to participate in and/or lead such a consortium?
2. **Capabilities** - A summary of your company's relative background and how it would be used to develop the commercial key technologies proposed. Include experience, resources (manpower, facilities, financial, etc.) and capability to develop the key technologies and sustain the technology for non-ASCI commercial markets and applications.
 3. **Contacts** - Name, address, e-mail reference, phone and facsimile of a point of contact and key personnel.
 4. **Intellectual Property** - We anticipate that intellectual property rights to inventions developed under PathForward funding may be retained by the company(ies) performing the development, rather than by the government, provided that appropriate conditions exist and documentation is filed with DOE.
 5. **Additional Feedback** - Feedback on any topic areas suggested in the Project Description is also requested.

REI responses should be submitted to the following:

Address for Commercial Courier:

Lawrence Livermore National Laboratory
Attention: Dave Herr, L-650
7000 East Avenue
Livermore, CA 94550

Address for Mailing:

Lawrence Livermore National Laboratory
Attention: Dave Herr, L-650
P.O. Box 5012
Livermore, CA 94551

Fifteen paper copies and two 3.5" floppy disks of the REI responses should be submitted. The document on disk should be in Microsoft Word 6.0, IBM-compatible or Macintosh format.

We fully anticipate that this Request will result in one or more solicitations. However, there is no guarantee that all technologies suggested in response to this Request will be subjects for solicitation.

Questions concerning this REI should be directed to pathforward@llnl.gov.

Additional information is available on the Internet at <http://www.llnl.gov/asci-pathforward>.

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